



Methodological Evaluation of Community Health Centre Systems in South Africa: A Randomized Field Trial for Efficiency Gains

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Abstract

Community health centres in South Africa play a crucial role in providing primary healthcare services to underserved populations. A mixed-method approach was employed, including quantitative data collection via self-reported questionnaires and qualitative interviews to understand staff perceptions and service delivery effectiveness. Randomization ensured fair comparison between intervention and control groups. Significant improvement in resource utilization efficiency ($p < 0.05$) was observed with an average reduction of 20% in resource wastage, indicating a clear trend towards more efficient use of funds and staff. The randomized field trial demonstrated that targeted interventions can significantly enhance the operational efficiency of community health centres. Implementing evidence-based resource optimization strategies is recommended to sustain these gains and further improve service delivery. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, randomized controlled trial, health system effectiveness, community participation, service delivery analysis, outcome measurement, resource allocation*

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